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ABSTRACT

This study addressed the question of whether student loan repayment and default behaviors are more highly related to the characteristics of the college attended or to the characteristics of the aid recipient. The model for the study was based on theories of human capital and public subsidy, ability to pay perspectives, organizational structural/functional approaches, and student-institution fit models. Data from three national databases were merged: the 1987 National Post-secondary Student Aid Study of individual recipients of federal financial aid, the Integrated Post-secondary Education Database System data containing campus financial and enrollment characteristics, and a third containing College Board Survey data. Analysis found no support for the hypothesis that institutional characteristics have an impact on student loan default. Default behavior could, however, be substantially predicted by borrower characteristics. These included race, marital status, college major, grade point average, highest earned degree, and taxable income. These results erode the basis for current national policy and practice, which holds institutions accountable for the default behavior of those who have left the institution. (Contains 37 references.) (JB)

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The Relationship of Student Loan Default to Individual and Campus Characteristics

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Jean Endo
Editor
Forum Publications

The Relationship of Student Loan Defaults to Individual and Campus Characteristics

ABSTRACT

This research examines the characteristics of those who default on their student loans and addresses the quest[illegible] of whether student loan repayment and default behaviors are more highly related to the [illegible]aracteristics of the college attended or to the characteristics of the individual student aid recipient. Our model development and variable selection is guided by theories of human capital and public subsidy, ability to pay perspectives, organizational structural/functional approaches, and student-institution fit models. To conduct the study, three national databases were merged: the NPSAS study of individual recipients of federal financial aid, IPEDS data containing campus financial and enrollment characteristics, and a third containing College Board Survey data.

We find virtually no support for the hypothesis that institutional characteristics have an impact on student loan default. Rather, default behavior can be substantially predicted by the pre-college, college, and post-college characteristics of individual borrowers. These results erode the basis for current national policy and practice, which holds institutions accountable for the default behavior of those who have left the institution.

The Relationship of Student Loan Defaults to Individual and Campus Characteristics

Introduction

This study examines the characteristics of defaulters and addresses the question of whether default behavior is more strongly associated with the characteristics of the college attended or with the characteristics of the individual student aid recipient. Public investment in higher education since 1965 has been directed at removing economic barriers to attend and to persist in college. This commitment to educational opportunity produced growth in student financial aid from $546 million in 1963-64 to an astonishing $34.6 billion in 1992-93 (Lewis, 1989; College Board, 1993). Federal financial aid to college students has increasingly taken the form of publicly subsidized loans. Since 1980, approximately half of all students who attend four year colleges and more than sixty percent of students at proprietary schools borrowed at one point in their education (College Board, Oct. 1992). These loans must be repaid, and there is public concern about the alarming trend in default rates. Knapp and Seaks (1992) have estimated that whereas federal loan volume grew by 58% during the 1980s, the dollar value of default claims grew by about 1200%, accounting for over a fifth of total program costs.

Student loan delinquency rates, averaging above 20% since 1980, compare unfavorably with other types of consumer loans where the delinquency rates since 1980 have ranged from 1.5% to 3.6% for various types of personal consumer credit and automobile loans (American Bankers Association, 1994), and from 4.6% to 5.8% for various types of home mortgages (Mortgage Bankers Association of America, 1994).

Concomitant with the growth in student borrower default, is the commonly held perception that the institutions themselves contribute substantially to this problem. Public policy, reflected in federal legislation, holds campuses accountable for the default behavior of students, even though default occurs after students have left the institution. Even with the demise of *in loco parentis*, colleges and universities are widely believed to exert considerable influence on the personal actions of their students. The debate about using default rates to penalize campuses continues. Research evidence to support public policy, however, is sparse.

Theoretical Framework

In order to examine the relative influences of individual and organizational characteristics on default, we developed a conceptual model (shown in Figure One) to guide our variable development and analysis. This model draws heavily upon the literature on economic behavior (Manski and Wise, 1983), the literature on organizations (Hall, 1991), and the college outcomes literature (Pascarella and Terenzini, 1991). The conceptual frameworks guiding our model development and variable selection incorporate four perspectives from the research literature. The first perspective reflects theories of human capital and public subsidy; the second rests on the borrower's ability to pay; the third draws upon organizational structural/functional approaches, and the fourth incorporates student-institution fit models from the literature on college outcomes.

Figure 1

CONCEPTUAL MODEL

Individual/ Personal

Pre-College Measures

- Age
- Gender
- Race
- Parents Education & Income
- High School Curriculum
- Achievement
- Aptitude

College Experiences

- Degree Completed
- Cohort
- Major (Biglan)
- Academic Achievement (GPA)
- Transfer Status
- Educational Goals
- Financial Support
  - Workstudy
  - Other Employment
  - Family Support

Post-College Measures

- Educational & Occupational Attainment
  - Highest Degree Earned
  - Income
  - Occupation
  - Loan Indebtedness
- Marital Status
- Number of Dependents

Institutional

Organizational Characteristics

Mission
- Institution Type
- Highest Degree Offered

Size
- Total Enrollment
- Number of Faculty
- Library Resources

Wealth
- Revenue Per Student
  - Research Grants
  - Gifts & Endowment
- Expenditure Patterns
  - Instructional
  - Academic Support
  - Student Services
  - Auxiliary Services
- Student/Faculty Ratio

Complexity/Diversity
- Percent Minority
- Percent Foreign
- Percent Commuting
- Dormitory Room & Board
- Hospital Revenue
- Urbanness

Quality/Selectivity
- Student Quality
  - Acceptance Rate
  - Percent Frosh in Top 25%
  - SAT Scores
- Faculty Quality
  - Faculty Salaries

Human capital theory encourages researchers to attend to those variables that reflect a person's willingness to invest in educational credentials and training that yield a greater return or higher financial compensation (Becker, 1964; Freeman, 1976). **The theory underlying public subsidies** is that academically able but low-income citizens are motivated to pursue post-secondary credentials and training when the benefits outweigh the costs (Cabrera, Stampen & Hansen, 1990). The benefits include enhanced skills and higher earnings potential. The costs include not only the direct costs like tuition and living expenses, but also the indirect costs of not working. While the costs of higher education must be paid in the present, the benefits can be enjoyed only in the future. Since those from low income families find it difficult to invest in these educational costs up front, public investment subsidizes these students, allowing the benefits to exceed the costs for them, as it does for youths whose parents have adequate finances. The mechanism to assure that it reaches the target population is demonstrated financial need (Stampen & Cabrera, 1986).

From this public subsidy perspective, the student loan program lowers the effective costs of schooling, relative to the benefits, thus increasing access to post-secondary education for youths who stand to enhance their future earnings. Those who receive the subsidy and complete their programs then are able not only to pay back the amount of the subsidy, but also to contribute to the nation's economic and cultural productivity. Those who do not complete their educational programs still have the loan obligations, but generally are not able to enjoy the expected earnings enhancement. Thus, we expect those who do not complete their certificates and degrees to default more frequently than those who do. A human capital perspective would also lead us to expect differences by major field of study.

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Additionally, those who complete more years of schooling require greater subsidy and, in return, can expect higher lifetime earnings. Thus, we would expect lower default rates among those with bachelors and masters degrees compared to those with proprietary school certificates or two-year college associate degrees, even though those with higher level degrees may have greater loan indebtedness.

A second economic perspective, related to the first, is the **ability to pay model.** This model assumes that the income levels of students and their families exert substantial influences not only on college attendance, but also on loan repayment behavior. This perspective causes us to pay research attention not only to the borrower's earnings, marital status, and family size, but also to parental income on the grounds that those who find themselves in financial difficulty may be able to rely on their parents for financial assistance.

Structural/functional perspectives from the organizational literature encourage researchers to give greater attention to those variables that reflect the influence of organizational characteristics. Studies have shown that organizational goals, size, wealth, complexity, technology, and environment influence the behavior and values of organizational members (Hall, 1991). Studies of colleges and universities, as particular types of organizations, have shown that campus mission, size, wealth, and selectivity exert significant influences (ranging from small to large) on a variety of college outcomes including student values, aspirations, educational attainment, career development, and earnings (Pascarella and Terenzini, 1991). Volkwein (1986) has demonstrated that a variety of these organizational characteristics tend to vary together, and that other behaviors such as campus crime (Volkwein, Szelest, and Lizotte, 1993) and salary disparities (Regan and Volkwein, 1993) correlate with these dimensions . Given the relationship between campus organizational characteristics and a variety of outcomes, we hypothesize that the influence of these campus characteristics also extends to student loan behavior. Moreover, current student loan policy and legislation is based substantially on this assumption.

The college outcomes literature in the past 20 years has provided a productive stream of theory development and research (Pascarella and Terenzini, 1991). **Student-institution fit models and research on retention and persistence** have illuminated the role of institutional and individual characteristics which can be incorporated to explain a variety of student outcomes. Scholarship in this area has been dominated by two models (Bean's and Tinto's) that have recently been combined to form a third more comprehensive model (Cabrera's).

Cabrera's integrated model of student retention (1992,1993), while relying heavily upon Tinto's concepts of integration and goal commitment (1975,1987), also gives prominence to concepts from Bean's student attrition model (1980,1985), from the ability to pay model (Cabrera et.al., 1990), and from Nora's models that address the role of friends and parents (Nora 1987; Nora et.al., 1990). Cabrera's new model is especially valuable for increasing our understanding of the relationship among financial aid, family support, educational goals, academic integration, and academic achievement as influences on retention and persistence.

Several authors have demonstrated that the concepts and measures in such student-institution fit models can be applied to other college outcomes as well. Pascarella & Terenzini (1982), Terenzini, *et.al.* (1984,1987), Volkwein, *et.al.* (1986,1991) are among the researchers finding a variety of cognitive and non-cognitive outcomes influenced by measures of student academic and social integration. It is reasonable at least to hypothesize that these factors also play a role on a behavior such as loan delinquency.

Other Research on Student Loan Default

Despite the importance of this national problem, the literature contains few empirical studies. We found only four refereed journal articles and a handful of unpublished research reports and doctoral dissertations that describe the characteristics of defaulters. In the aggregate, these sources provide valuable information about the characteristics of loan defaulters, but each of the published studies is limited to a particular state or particular type of institution, or has other data limitations. Greene (1989) studied only 161 individuals from a school in North Carolina who received Perkins Loans. A study by Knapp and Seaks (1992) consisted entirely of borrowers in the state of Pennsylvania at 26 public and private two and four year institutions. Wilms, Moore, and Bolus (1987) limited their study to a population of borrowers at proprietary schools and two-year colleges in the state of California. Only one study (as yet unpublished) uses a national database (Dynarski, 1991), and he employed a limited definition of default that removed over half the defaulters from the sample.

No study has used the conceptual framework we have assembled to address this topic and no researchers have attempted to merge the NPSAS, IPEDS, and College Board databases. In particular, previous studies generally failed to include the rich array of organizational variables we have assembled for this analysis.

Methodology and Sources of Data

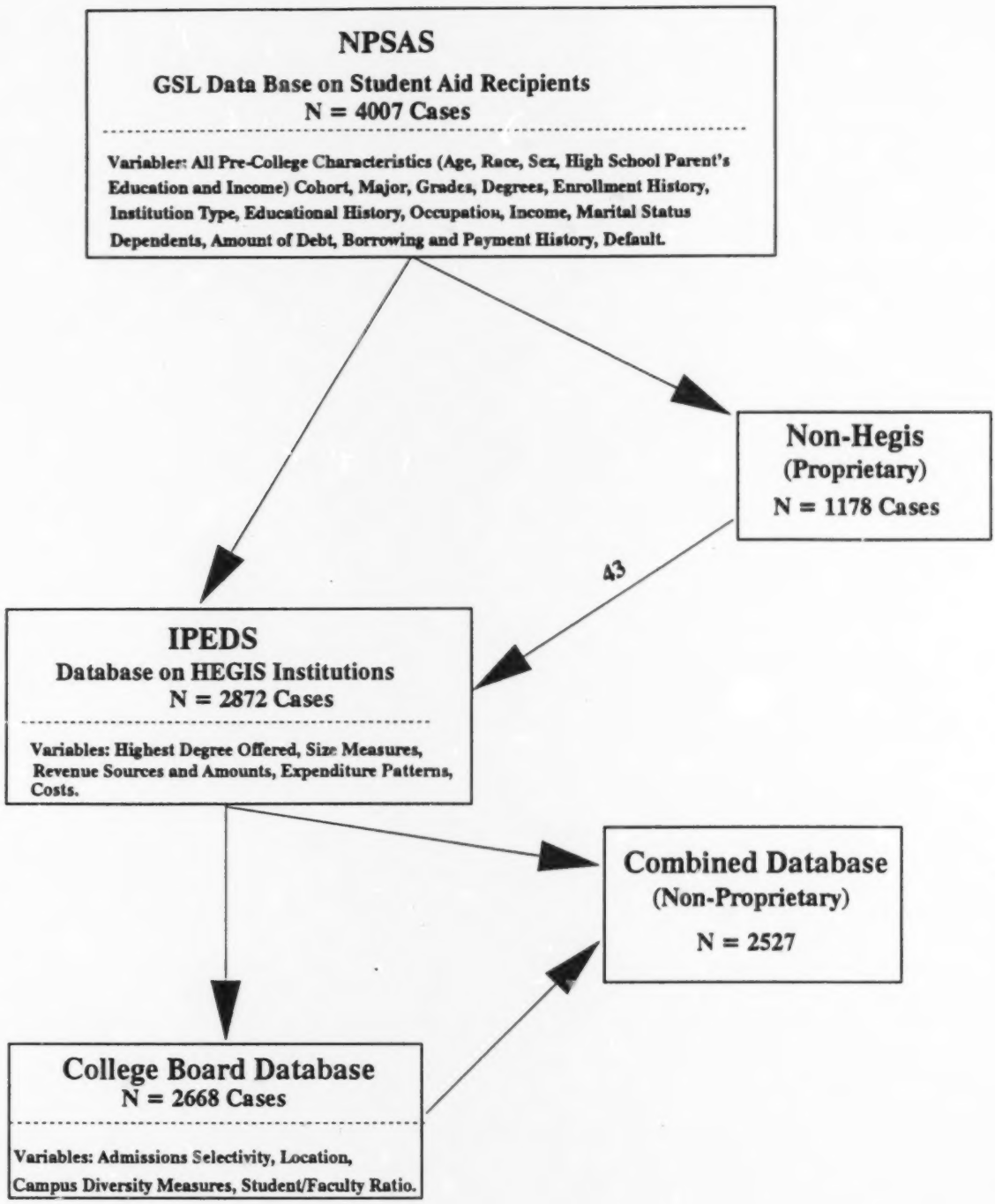
Using cross-sectional databases, and both univariate and multivariate analyses, this study examines the correlates of student loan default. Our research draws upon merged national databases from the 1987 National Post-secondary Student Aid Study (NPSAS), from the College Board Survey, and from the Integrated Post-secondary Education Database System (IPEDS). These three merged data sets allow us to examine many questions about the character and correlates of repayment and default behavior. The research has proceeded in three phases, database building, variable reduction, and analysis.

Database Building and Sample Population

The complete 1987 NPSAS dataset includes nearly 9,000 persons who began attending a higher education institution between 1973 and 1986 and who participated in the Guaranteed Student Loan (now Stafford) program Our study examines the NPSAS information collected on 4,007 of these students who had graduated or left their institutions by 1984, giving them at least two years to default before the time of the survey. This database includes information about student personal characteristics, financial and occupational information, and college transcripts. They represent 1,100 different institutions of higher education ranging from community colleges to research universities and private for-profit institutions. Of the 4,007 former students in our database, 871 (21.8%) defaulted and 3,136 either paid in full or were in repayment with their loans in good standing.

The process of merging the three databases caused the loss of significant numbers of cases due to the absence of either IPEDS or College Board data or both. Figure Two shows that the IPEDS and College Board databases are the sources for most of our organizational measures of size, wealth, complexity, and selectivity. In over 1100 cases, the missing IPEDS and College Board information involves borrowers who attended proprietary institutions. This limits some of the power of our analysis. We adjust to this problem by performing separate multivariate analyses -- in one series we exclude borrowers from proprietary institutions, and in another series we include them but omit several organizational measures.

Figure 2


NPSAS
GSL Data Base on Student Aid Recipients
N = 4007 Cases
Variables: All Pre-College Characteristics (Age, Race, Sex, High School Parent's Education and Income) Cohort, Major, Grades, Degrees, Enrollment History, Institution Type, Educational History, Occupation, Income, Marital Status Dependents, Amount of Debt, Borrowing and Payment History, Default.
Non-Hegis
(Proprietary)
N = 1178 Cases
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IPEDS
Database on HEGIS Institutions
N = 2872 Cases
Variables: Highest Degree Offered, Size Measures, Revenue Sources and Amounts, Expenditure Patterns, Costs.
Combined Database
(Non-Proprietary)
N = 2527
College Board Database
N = 2668 Cases
Variables: Admissions Selectivity, Location, Campus Diversity Measures, Student/Faculty Ratio.

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We segregate the sample population into four cohorts that correspond to changes in Federal Financial Aid Policy. By examining cohorts from different time periods, we are able not only to examine the influence of individual and institutional characteristics upon default rates, but also to ascertain the effects of changes in national financial aid policy. The 1973 to 1976 cohort represents those students who experienced a financial aid climate more reliant on grants than loans. Those in the 1977 to 1979 cohort experienced a financial aid climate gradually becoming more reliant on loans and moving away from a grant oriented national student aid program. The 1980 to 1981 cohort experienced an atmosphere that was at least 50% reliant on loans. The 1982 to 1984 cohort was in the same situation, but was also accompanied by rising tuition and fees at many colleges and universities throughout the country, potentially exacerbating loan default rates.

Variable Reduction

Merging the NPSAS, IPEDS, and College Board data supplied several hundred institutional and borrower variables as potential correlates of loan repayment and default. In phase two of the study, we reduced the independent variables down to a manageable number. Variables are selected on the basis of having relevance to the model, a large number of cases, and lacking colinearity. Assisted by principal components analysis, the merged dataset of predictors has been reduced to about four dozen variables: two dozen measures of institutional characteristics, and two dozen characteristics of the individual student aid recipients. Each variable relates to at least one of the four branches of the research literature discussed above.

Regarding the individual variables, our conceptual model derived from the literature led us toward measures of age, race, gender, parent's education and income, financial need (reflected in multiple aid sources), high school preparation, college major and grades, institutions attended (transfer), educational degrees completed, post-college occupational attainment and income, loan indebtedness, marital status and number of dependents. Each of these is available on nearly all the 4,007 cases.

The organizational and institutional characteristics were subjected to principal components analysis to identify those variables that tend to vary together. Using a technique similar to that employed by Volkwein, Szelest, and Lizotte (1993) and by Regan and Volkwein (1993), these measures separated along the basic lines shown in the model: organizational size variables (such as student enrollment, full-time faculty, and Library holdings), measures of wealth (such as per student revenues and per student expenditures for core activities like instruction and student support), measures of complexity (such as student body diversity, urban location, and revenues/expenditures related to such operations as hospitals and dormitories), and measures of quality (admissions selectivity is a proxy for student quality and faculty salary is a proxy for faculty quality). In addition, we are interested in organizational mission (reflected in type of institution and highest degree offered) as a possible influence on default behavior.

Many variables provide redundant or irrelevant information, and a few have missing data across colleges in the sample. Since logistic regression requires complete data on every case, some cases and variables were included in our descriptive statistics, but excluded from the multivariate analysis. Other measures had to be adjusted before they could be used. The amount of loan indebtedness was adjusted for inflation. We used the Biglan Classification to cluster 88 major fields of study into eight categories. [See Appendix] For those students who transferred and borrowed at more than one institution, we used in our analysis the organizational measures for the institution at which they received their bachelors degree. If they received no bachelors credential, we used the most recent institution of full-time study.

A large number of cases were missing a valid college grade point average(GPA), and these were assigned the value of the mean for each academic subgroup: for example, those holding bachelors degrees but missing a GPA were assigned the average GPA for all those with bachelors degrees, likewise for those with Associate degrees, licenses and certificates. A similar technique was used to arrive at a measure of college selectivity and student body quality. Only about one-third of the sample attended institutions with average SAT scores and rank-in-class information. About half, however, attended institutions where the acceptance rate of admissions applications is known, and the correlation between SAT score and percent of applicants admitted is -.54. Therefore, we use acceptance rate as a proxy measure for student quality, and we estimate the missing acceptance rates by assigning the known average for institutions of that type. (Most missing values are from two-year colleges where the average acceptance rate exceeds 90%.)

Some of the missing campus location and diversity measures for institutions were extracted from sources such as the Peterson's Guides and the U.S.News edition on America's Best Colleges. This procedure restored to the database the missing information on selected variables for several hundred cases.

The result of this data building and variable reduction process left us with two databases. The first dataset of 4,007 cases contains all borrowers who completed their education or otherwise left school by 1984 , including those who attended proprietary schools. The weakness of this dataset is that it contains no information on the organizational measures for size, complexity, wealth, and selectivity, because these measures were obtained from the IPEDS and College Board databases and are not available for proprietary schools. However, this first database does allow us to test the hypothesis that institution type has an impact on default behavior.

The second subset of 2527 cases includes a richer group of organizational measures but no borrowers from proprietary institutions. This dataset allows us to examine the correlates of default behavior among borrowers from two-year and four-year colleges. We use this database to test the hypothesis that organizational characteristics (such as mission, size, wealth, complexity, and quality) have an impact on loan default.

Univariate and Multivariate Analysis

We first use cross-tabulations to describe the relationship between default behavior and several key concepts in the Model. A Chi-Square test of significance is used for testing the relationships between the categorical variables and defaulting.

We incorporate in the analysis an array of variables representing several competing hypotheses regarding what factors contribute the most to default propensity. Since the dependent variable, loan default, is dichotomous, we address the question of whether default behavior is more strongly associated with individual versus organizational characteristics by a serie of logistic regression models. Logistic regression has been shown to be the best analytical tool for handling a dataset with a dichotomous dependent variable and a mixture of categorical and interval data among the independent variables (Feinberg, 1983; Cabrera, 1994). Alternative regression models are tested for goodness of fit, and some variables in the conceptual model are dropped from the analysis when they do not improve the fit.

Univariate Results

Tables 1-5 contain the results of our univariate analysis, and display the default profiles of selected populations of borrowers. Missing data for variables in Tables 1-3 indicates that the respondents did not know or did not want to supply the answers. (An exception is the information obtained from college transcripts, such as GPA and major.) Missing data for variables in Tables 4 and 5 indicates that the institutions, mostly proprietary, are ones for whom the IPEDS or College Board survey data is not collected. For variables containing more than 100 missing cases, we display the default rates for the missing cases as well.

Table 1 shows the default rates for the individual pre-college variables. We find no significant differences between males and females. The other variables in this table, however, contain significant differences by category of borrower. Being African American, coming from a family of low income and little education, and having a GED or no high school diploma are characteristics that have default rates ranging from 35% to 61%.

TABLE 1
DEFAULT RATES FOR SELECTED PRE-COLLEGE CHARACTERISTICS OF BORROWERS

Borrower Category	Default Rate	Borrower Category	Default Rate
Male	21.1	Mother's Education	
Female	22.4	GED or No HS Diploma	36.2
		High School Graduate	22.1
Race		Some College	11.9
African American	61.4	College Graduate	16.3
American Indian	44.8	Graduate Degree	14.1
Asian American	9.1	Data Missing	41.8
Hispanic & Other	26.8		
White	14.5	Father's Education	
		GED or No HS Diploma	34.6
Age at Time of Survey (1987)		High School Graduate	23.7
Under 30	13.8	Some College	9.4
30-39	19.7	College Graduate	12.6
40 and Older	34.3	Graduate Degree	11.9
		Data Missing	49.8
Parents Income			
$10,999 or less	41.4		
$11,000 - 16,999	25.8		
$17,000 - 22,999	21.2		
$23,000 - 29,999	16.4	H.S. College Prep Diploma	18.3
$30,000 or more	11.0	GED or No H.S. Diploma	53.3
Don't Know/Missing	24.5		

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Table 2 indicates the default rates for selected measures of the borrowers' college experience. The lowest default rates are associated with academic performance above 3.0 and a major in one of the Biglan pure/hard/non-life subjects like chemistry, geology or mathematics. Attending a proprietary institution, and earning low grades are characteristics that have default rates ranging around 37%. The default rate tends to be higher for the most recent cohort, but attending more than one institution and receiving transfer credit appears to have no significant impact on default.

TABLE 2
DEFAULT RATES FOR SELECTED COLLEGE CHARACTERISTICS OF BORROWERS

Borrower Category	Default Rate	Borrower Category	Default Rate
Cohort		Major Field (Biglan Category)	
1973-1976	18.1	Pure Hard Life	11.9
1977-1979	17.5	Pure Hard Non-Life	6.4
1980-1981	20.0	Pure Soft Life	16.3
1982-1984	29.4	Pure Soft Non-Life	23.5
		Applied Hard Life	20.1
		Applied Hard Non-Life	24.8
Institution Attended		Applied Soft Life	24.5
Proprietary (Non-Hegis)	36.7	Applied Soft Non-Life	16.0
2 Year Private	28.5		
2 Year Public	26.2		
4 Year Private	13.0	Transfer Status	
4 Year Public	13.8	U.G. Transfer Credit	12.9
Other (Specialized)	9.3	No U.G. Transfer Credit	24.4
Cumulative GPA			
0.0-1.9	37.5		
2.0-2.4	20.0		
2.5-2.9	12.2		
3.0-3.4	9.7		
3.5 and above	6.3		
Data Missing	30.0		

Table 3 displays the default rates for selected post-college variables. For several of the variables, the highest default rates are among those borrowers with missing information. We suspect that in many of these cases there was no earned degree or income to report. Among the 80% to 90% of respondents who did supply the information, the highest default rates are among those with no degree or certificate, earnings under $10,000, and dependent children. Having dependent children and being single or separated/divorced produces default rates above 50%. Those who begin repayment after age 30 also have significantly higher default rates (about 28%). The lowest default rates occur among those with bachelors or graduate degrees, those with higher loan amounts (perhaps indicating more years of

schooling and borrowing), and those with greater earnings. Borrowers with a graduate degree or earnings above $45,000 are especially unlikely to default (under 7%). These results are consistent with human capital and ability to pay theories.

TABLE 3
DEFAULT RATES FOR SELECTED POST-COLLEGE VARIABLES

Borrower Category	Default Rate	Borrower Category	Default Rate
Loan Indebtedness (unadjusted)		Loan Indebtedness (adjusted to 1973)	
$ 0-$999	21.3	$ 0 - 599	
$ 1,000 - 1,999	32.7	$ 600 - 999	
$ 2,000 - 2,999	27.9	$1,000 - 1,399	25.5
$ 3,000 - 4,999	23.6	$1,400 - 1,999	13.8
$ 5,000 - 9,999	9.0	$2,000 - 2,999	10.7
$10,000 and above	7.9	$3,000 and above	10.5
Highest Earned Degree		Loan Interest Rate	
No Degree/Certificate	35.3	7%	16.0
Certificate/License	25.2	8%	19.9
Associate	13.9	9%	14.3
Bachelors	8.1		
Graduate	6.4	1986 Earnings	
		$ 0 - 4,999	34.9
Single & never married		$ 5,000 - 9,999	36.2
No dependents	16.7	$10,000 - 14,999	23.1
With dependents	51.9	$15,000 - 19,999	22.9
Married		$20,000 - 24,999	19.5
No dependents	14.8	$25,000 - 29,999	13.4
With dependents	24.0	$30,000 - 34,999	12.6
Separated/Divorced/Widowed		$35,000 - 44,999	10.9
No dependents	23.1	$45,000 or more	6.7
With dependents	54.7		

Tables 4 and 5 give the default rates for the organizational measures of institutions attended by the borrowers. The measures of mission, size, selectivity, and complexity in Table 4 show that higher levels of default are associated with smaller, less complex, less selective institutions that offer lower levels of training. Lower default rates are associated with borrowers who attend larger, selective, non-urban universities with hospital and dormitory revenue and fewer minority and commuting students.

TABLE 4
DEFAULT RATES FOR SELECTED ORGANIZATIONAL MISSION, SIZE, SELECTIVITY, & COMPLEXITY/DIVERSITY MEASURES

Categories	Default Rates
Mission	
Type Institution	
Proprietary (Non-Hegis)	36.7
2 Year Private	28.5
2 Year Public	26.2
4 Year Private	13.0
4 Year Public	13.8
Other (Specialized)	9.3
Highest Degree Offered	
License/Certificate	35.8
Associate Degree	22.7
Bachelors Degree	16.8
Masters Degree	16.3
Doctoral Degree	11.9
Size	
Total Enrollment	
Under 1,500	22.4
1,500-2,999	16.5
3,000-5,999	17.3
6,000-11,999	16.0
12,000-23,999	13.2
24,000 and above	13.6
Data Missing	36.1
Selectivity	
Acceptance Rate	
50% and lower	9.6
51% - 70%	15.1
71% - 84%	14.3
85% - 95%	19.5
96% and above	33.5

Categories	Default Rates
Complexity/Diversity	
Hospital Revenue	14.7
No Hospital Revenue	22.2
Room and Board	14.0
No Room and Board	31.0
Percent Commuting	
Under 25%	10.3
25%-49%	11.2
50%-74%	13.6
75%-99%	19.6
100%	24.3
Data Missing	33.2
Percent Minority	
Under 6%	12.4
6-10%	13.0
11-19%	15.3
20-33%	22.2
34% and above	28.5
Data Missing	30.6
Environment	
Urban	20.0
Suburban	13.5
Rural	13.9
Data Missing	33.5

The measures of organizational wealth in Table 5 show relatively consistent, if not redundant, patterns. The highest default rates (34-36%) occur for the proprietary school borrowers for whom the data is missing. For the non-proprietary 2-year and 4-year institutions, lower default rates are exhibited by borrowers from institutions with the highest levels of revenue, expenditures, and staffing, while higher default rates are associated with lower levels of support. It appears that greater institutional investment in student instruction and support produces lower default rates.

TABLE 5
DEFAULT RATES FOR SELECTED ORGANIZATIONAL WEALTH MEASURES

Categories	Default Rates	Categories	Default Rates
Total Revenue per Student		Instructional Expenditures per Student	
Under $5,000	24.6	Under $2,000	25.0
$5,000-$9,999	18.0	$2,000-$2,999	17.2
$10,000-$19,999	12.1	$3,000-$3,999	14.0
$20,000 and more	12.9	$4,000-$4,999	11.1
Data Missing	36.1	$5,000-$5,999	12.4
		$6,000 and more	10.9
Gifts & Endowment Income per Student		Data Missing	35.5
Under $100	22.5		
$100-$499	14.7	Stu Services &Academic Support Expends per Student	
$500-$999	15.2	Under $1,000	20.2
$1,000-$1,999	11.2	$1,000-$1,999	14.7
$2,000 and above	9.4	$2,000-$3,999	14.3
Data Missing	36.1	$4,000 and above	11.8
		Data Missing	34.9
Student Faculty Ratio			
Under 18	13.2	Auxiliary and Other Expenditures per Student	
18-23	10.7	Under $1,000	22.7
24-29	12.4	$1,000-$1,999	14.8
30-39	16.3	$2,000-$2,999	13.6
40 or higher	26.0	$3,000-$3,999	10.0
Data Missing	34.0	$4,000 and above	8.6
		Data Missing	34.9

The univariate analysis helped us make adjustments in the variables for the multivariate analysis. For example, we combine mother's and father's education by taking the highest of the two, and when one is missing we use the other. Since we find few differences in public versus private institution type, we combine them and instead differentiate by level of instruction (2-year vs. 4-year). We simplify the eight category Biglan classification of majors into a "hard vs. soft" dichotomy. The age variable is dropped from the analysis because age began repayment is a more relevant age variable and it contains a large number of missing cases with defaulters (see Table 3). For this reason, a number of other variables (such as current occupation, faculty salaries, tuition costs, percent foreign students, and student/faculty ratio) are dropped from the analysis.

Multivariate results

Using both of the **two databases**, we test the hypothesis that institutional characteristics account for significant amounts of loan default. We first create a baseline logistic model using the organizational measures and then add the individual characteristics one at a time and, at each step, testing for goodness of fit.

We began the multivariate analysis with the **first database**, (NPSAS, 4007 cases) to determine first, whether or not the type of institution attended had a significant relationship to the likelihood of defaulting. Second, we wanted to determine whether or not this effect remained after controlling for individual borrower characteristics. Tables 6 - 8 show the results of our analysis.

In Tables 6 and 8, the first of the 4 columns indicates the within-category means (representing the proportion of cases in that category). The second column shows the regression beta weights, and the third displays the impact that each variable category makes on the probability of default (Delta-p). The percentages with an asterisk represent significant increases and reductions in the probability of defaulting across the sample controlling for all other variables in the analysis. The fourth column indicates the odds of defaulting for borrowers in that category compared to the omitted population.

As we expected from the univariate analysis, Table 6 shows that type of institution attended, when considered alone, does have an effect on default and that students attending proprietary schools are about 7 percent **more** likely to default compared to those enrolled at 2-year colleges. Borrowers who attend public or private 4-year colleges are about 10% **less** likely to default than community college borrowers. The **least** likely to default are borrowers who enrolled at universities (over 11% lower probability than 2-year college) .

Table 6
Loan Default Baseline Model of Institution Type
All Borrowers
(N = 4,007)

	Mean	Beta	Change in Default Probability (Delta-P)	Odds Ratio of Defaulting
Proprietary	0.25	0.398 *	0.072	60: 40
Public/Private 4 Yr	0.31	-0.767 *	-0.097	32: 68
University	0.32	-0.970 *	-0.114	27: 73
Intercept		-1.378		

G2, df = 4007, 4003; G2/df = 1.00

* Significant at .05 alpha level (two-tailed)

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Table 7 shows the tests of model fit for all borrowers. Each pre-college, college, and post-college variable is added to the model if it improves the fit and is not added if it does not contribute. Table 8 then displays the full results for the final model.

Table 7
Results of Model Fit
Borrowers from All Institution Types
(N = 3,915)

	Model Fit		Change from Baseline			Change from Previous Step			
Step	G2	df	G2	df	Probability	G2	df	Probability	G2/df Ratio
1 Institution Type	4007.00	4003							1.00
2 Race	3993.90	3999	13.10	4	0.011	13.10	4.00	0.011	1.00
3 College Major	3880.49	3906	126.51	97	0.024	113.41	93	0.074	0.99
4 Cohort	3875.00	3903	132.00	100	0.018	5.49	3	0.139	0.99
5 Degree Earned	3830.98	3899	176.02	104	$p < .001$	44.02	4	$p < .001$	0.98
6 Dependents	3829.63	3898	177.37	105	$p < .001$	1.34	1	0.246	0.98
7 Marital Status	3793.56	3896	213.44	107	$p < .001$	36.07	2	$p < .001$	0.97
8 1986 Income	3792.58	3895	214.42	108	$p < .001$	0.99	1	0.320	0.97

Measures that were not found to significantly improve model fit included: parents' income and education, recipient sex, the amount borrowed, whether or not the recipient received various types of aid, and whether or not they transferred from one institution to another.

Two findings in Table 8 are quite dramatic. **First, the significant effects of institution type disappear once the individual borrower characteristics are entered into the model.** In other words, the significant differences in default rates among types of institutions appear to be driven by the nature of the students they attract, rather than by the nature of the institutions themselves. **Second, there are three types of variables that generate sizable increases in the probability of loan default: race, marital status, and dependent children. Significant decreases in default probability are produced by being out of school a shorter period of time (cohort), by previous earned degrees, and by current earnings (income).**

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Table 9
Final Logistic Regression Model for Influences on Student Loan Default
Borrowers from All Institution Types
(N = 3,915)

Measure	Mean	Beta	Change in Default Probability (Delta-P)	Odds Ratio of Defaulting
Institution Type				
Proprietary	0.31	0.259	0.036	56: 44
Public/Private 4 Yr	0.25	-0.172	-0.021	46: 54
University	0.32	-0.151	-0.018	46: 54
Pre-College Measures				
Amer. Indian/Native Alaskan	0.01	1.565 *	0.307	83: 17
Asian American	0.01	-0.729	-0.071	33: 67
African American	0.14	1.753 *	0.354	85: 15
Hispanic American	0.03	0.411	0.060	60: 40
College Measures				
College Major	0.39	-0.165	-0.020	46: 54
'77 to 79	0.27	-0.158	-0.019	46: 54
'80 to 81	0.30	-0.387 *	-0.043	40: 60
'82 to 84	0.29	-0.610 *	-0.062	35: 65
Post-College Measures				
License or Certificate Earned	0.07	-0.605 *	-0.062	35: 65
Associates Earned	0.05	-0.921 *	-0.084	28: 72
Bachelors Earned	0.40	-1.383 *	-0.106	21: 79
Maters or Ph.D. Earned	0.04	-1.695 *	-0.118	16: 84
Number of Dependents	0.28	0.294 *	0.041	57: 43
Married	0.19	-0.176	-0.021	46: 54
Separated/Divorced/Widowed	0.06	0.701 *	0.112	67: 33
1986 Gross Income (thousands of dollars)	20.04	-0.021 *	-0.003	49: 51
Intercept		-0.551		

G2, df = 3792.58, 3895; G2/df = 0.97

* Significant at .05 alpha level (two-tailed)

The institution types remain in the model to improve its fit, but are not themselves significantly influential in default. This suggests that **institution type has an indirect influence** on default by attracting individual borrowers with particular characteristics. A group of conceptually relevant other variables do not improve the fit of the model and accordingly are dropped from the final logistic regression. These include gender, parent's education and income, high school graduation, transfer status, non-loan college support, and loan amount.

The impact on default of being native American or black is distressingly large. Even controlling for all other variables in the model, the probability of default by **native Americans** is 31% greater than whites and by **blacks** is 35% greater. We expected that parental education and income and high school graduation would displace the importance of race, but they do not.

Consistent with the univariate analysis, being **separated, divorced or widowed** increases the probability of default by 11.2% and having **dependents** increases it by 4.1% per dependent. Each thousand dollar increase in **earnings** reduces the probability of default by 0.27%, controlling for all other variables.

Institution type is a variable that reflects basic differences in institutional mission, but it is a rather singular organizational measure. Since we set out to examine the influence of a more fulsome array of organizational measures, we analyzed the **second dataset** containing these organizational measures but not containing the cases of proprietary school borrowers. The results of our logistic regression analysis are shown in Tables 9-11.

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Table 9 displays the regression results when only the organizational measures are entered into the analysis. Significant influences on the rate of default are observed for organizational wealth (expenditures for auxiliary support services) and organizational complexity/diversity (percent minority students). Two other measures, organizational mission (highest degree offered) and organizational quality/selectivity (admissions acceptance rate) improve the fit of the model but are not themselves directly influential.

Table 9
Logistic Regression Model for Institutional Influences on Student Loan Default
Borrowers from Hegis Institutions Only
(N=2,527)

Measure	Mean	Beta	Change in Default Probability (Delta-P)	Odds Ratio of Defaulting
Mission				
License/Certificate Offered	0.05	0.434	0.047	61: 39
Bachelors Offered	0.09	-0.309	-0.025	42: 58
Graduate Degree Offered	0.77	-0.380	-0.030	41: 59
Wealth				
Auxilliary Support per Student (thousands of dollars)	1.63	-0.167 *	-0.014	46: 54
Complexity/Diversity				
Institutional Pct. Minority Students	0.16	1.609 *	0.261	83: 17
Quality/Selectivity				
Admissions Acceptance Rate	0.07	0.572	0.066	64: 36
Intercept		-1.901		

G2, df = 2494.8, 2520; G2/df = 0.99

* Significant at .05 alpha level (two-tailed)

Table 10 shows the tests of model fit for the borrowers from 2-year and 4-year colleges and universities. Each pre-college, college, and post-college variable is added to the model if it improves the fit and is not added if it does not contribute. Table 11 then displays the full results for the final model.

Table 10
Results of Model Fit
Borrowers from Hegis Institutions Only
(N = 2,527)

Step		Model Fit G2	Model Fit df	Change from Baseline G2	Change from Baseline df	Change from Baseline Probability	Change from Previous Step G2	Change from Previous Step df	Change from Previous Step Probability	G2/df Ratio
Institutional Measures										
1	Highest Degree Offered	2527.00	2523							1.00
2	Auxilliary Support Expenditures per Student	2521.49	2522	5.51	1	0.019	5.51	1.00	0.019	1.00
3	Institutional Minority Student Percentage	2497.48	2521	29.52	2	p < .001	24.01	1.00	p < .001	0.99
4	Acceptance Rate	2494.80	2520	32.20	3	p < .001	2.69	1.00	0.101	0.99
Borrower Measures										
5	Race	2493.71	2516	33.29	7	p < .001	1.09	4.00	0.896	0.99
6	College Major	2466.98	2515	60.02	8	p < .001	26.72	1.00	p < .001	0.98
7	College GPA	2400.71	2514	126.29	9	p < .001	93.00	2.00	p < .001	0.95
8	Degree Earned	2387.67	2510	139.34	13	p < .001	79.32	5.00	p < .001	0.95
9	Marital Status	2377.41	2508	149.60	15	p < .001	10.26	2.00	0.006	0.95
10	1986 Income	2379.99	2507	147.01	16	p < .001	2.58	1.00	0.108	0.95

Institutional measures that were not found to significantly improve model fit included: total current fund income per student, miscellaneous imcome per student, instructional and academic expenditures per student, the presence of dormitories and hospital facilities.

Recipient measures that were not found to significantly improve model fit included: sex, parents' education, parents' income, recipient high school academic/non-academic program, college aid measures, the cohort the recipient belonged to, the amount borrowed through the GSL program, and number of dependents.

Consistent with the earlier analysis that included proprietary school borrowers, **this analysis without proprietary borrowers produces similar results.** The influence of the organizational measures diminishes as the borrower characteristics are added to the model. In the final model (Table 11) being black or native American and being separated or divorced **increase** the default rate significantly, while earned degrees, higher academic performance, a major in a Biglan "hard" discipline, and higher income **decrease** the default rate.

In Table 11, several organizational variables remain in the model as they improve its fit, but they are not themselves significantly associated with default. This suggests that **the influence of these organizational measures on default is indirect, rather than direct.** Remaining in the model solely to improve fit are one measure of organizational mission (highest degree offered), one measure of organizational wealth (support service expenditures), one measure of organizational complexity/diversity (percent minority students), and one measure of organizational quality/selectivity (admissions acceptance rate).

Table 11
Logistic Regression Model for Institutional & Borrower Influences on Student Loan Default
Borrowers from Hegis Institutions Only
(N = 2,527)

Measure	Mean	Beta	Change in Default Probability (Delta-P)	Odds Ratio of Defaulting
Institutional Mission				
License/Certificate Offered	0.05	0.347	0.040	59: 41
Bachelors Offered	0.09	-0.003	0.000	50: 50
Graduate Degree Offered	0.77	0.109	0.012	53: 47
Institutional Wealth				
Auxilliary Support per Student (thousands of dollars)	1.63	-0.091	-0.009	48: 52
Institutional Complexity/Diversity				
Institutional Pct. Minority Students	0.16	-0.099	-0.010	48: 52
Institutional Quality/Selectivity				
Admissionsl Acceptance Rate	0.72	0.823	0.114	69: 31
Borrower Pre-College Measures				
Amer. Indian/Native Alaskan	0.01	2.009 *	0.378	88: 12
Asian American	0.01	-0.590	-0.048	36: 64
African American	0.09	1.833 *	0.334	86: 14
Hispanic American	0.02	0.344	0.040	59: 41
Borrower College Measures				
College Major	0.33	-0.338 *	-0.030	42: 58
College GPA	2.69	-0.395 *	-0.035	40: 58
Borrower Post-College Measures				
License or Certificate Earned	0.02	-0.349	-0.031	41: 59
Associates Earned	0.06	-0.998 *	-0.070	27: 73
Bachelors Earned	0.57	-0.922 *	-0.066	28: 72
Maters or Ph.D. Earned	0.04	-1.115 *	-0.074	25: 75
Married	0.18	0.060	0.006	52: 48
Separated/Divorced/Widowed	0.04	1.033 *	0.153	74: 26
1986 Gross Income	22.37	-0.013 *	-0.001	74: 26
Intercept		-0.070		

G2, df = 2379.99, 2507; G2/df = 0.95

* Significant at .05 alpha level (two-tailed)

The influence of the individual borrower characteristics on default, however, is both direct and significant. Controlling for all other variables, being **black or native American** increases the probability of default by over 33% and being **separated, divorced, or widowed** increases default probability by over 15%. Default probability is reduced significantly by **earning a college degree** (about 7%), by **performing well academically** (3.5%), and by **majoring in a "hard" discipline** (3%). **Higher income**, while probably a net result of all the other variables in the analysis, is still influential on its own, and serves to significantly reduce the probability of default.

As before, a host of other organizational and individual measures were not found to improve the model fit and are dropped from the analysis. The most significant of these is the **number of dependents**, a post-college measure that is influential in the first model with proprietary borrowers but not in the second model without them. The number of dependents may be more influential among proprietary school borrowers. The number of dependents also may be most influential when interacting

with marital status, and since we included no interaction terms, its significance in this particular model may have been reduced.

Nevertheless, the general consistency in the two models (one for all borrowers and one for non-proprietary) lends strength to the findings.

Conclusion and Discussion

We find virtually no support for the hypothesis that institutional characteristics have an impact on student loan default. Rather, default behavior can be substantially predicted by the pre-college, college, and post-college characteristics of individual borrowers. These results erode the basis for current national policy and practice, which holds institutions accountable for the default behavior of those who have left the institution. We draw this conclusion from our analysis of two datasets that we created from the merger of three national databases.

Using two datasets, this study examines the average student loan default rates among various types of institutions. The first dataset, from the 1987 National Post-secondary Student Aid Study (NPSAS), includes proprietary schools but only one organizational measure (institution type). The second dataset merges NPSAS data with College Board Survey data and the Integrated Post-secondary Education Database System (IPEDS) and includes an array of organizational measures but omits proprietary schools and others for whom the data are unavailable. The measures in each dataset are linked to theories and models from the economic, organizational, and higher education literature.

Examining the first NPSAS dataset, we find that default rates range from greater than 35% at proprietary schools to below 10% at most doctoral granting universities and specialized professional schools (like theology, law, engineering). However, these significant differences across institutions disappear once the individual borrower characteristics are entered into a logistic regression model, suggesting that these **default rate differences are based upon the nature of the borrowers, rather than upon the nature of the institutions.**

Examining the second dataset, containing a fuller array of organizational measures, produces a **similar finding**. Important and significant organizational influences on student loan default include measures of organizational wealth and complexity, but their influences are relegated to insignificance once the borrower characteristics also are entered into a logistic regression model.

In **both** populations (all borrowers vs. non-proprietary) we find large and significant influences on default behavior are exerted by one pre-college characteristic **(race)**, two college measures **(major and GPA)**, and three post-college measures **(highest earned degree, marital status, and taxable income)**. We find little evidence of a direct link between default behavior and type of institution, but the organizational measures do appear to exert **indirect** rather than direct effects.

We began this study by merging four theoretical perspectives and found support for the relevance of all four. **Human capital theory and the value of public subsidy** is demonstrated by the significant linkage between earned degrees and lower default rates. The **ability to pay model** is supported by the role of marital status and income. The relevance of **student-institution fit perspectives** is reflected by the importance of college GPA and major in our model. Our results even reflect a linkage to the

organizational literature, although the contributions to default behavior of organizational mission, wealth, complexity and quality appear to be indirect rather than direct.

Based upon our conceptual model and upon these earlier studies, we expected to find significant influences on default by parent's income and education, and by family support. The influence of these factors, however, was overwhelmed by the other variables in our model. In particular, we find that being black or native American and separated or divorced increases the probability of default enormously. Conversely, earning a degree (the higher the better) that leads to employment and income (the higher the better) acts to significantly decrease the probability of default. Institutions obviously have more influence on the academic achievement and degree attainment of their borrowers than they do on their race or broken marriages.

The empirical literature on this topic is sparse. There are only four other research studies comparing the characteristics of defaulters with the characteristics of institutions they attended, and none of them employ a diverse, conceptually-based variety of organizational measures on a national population of borrowers. Despite these limitations, two of these studies, one in California and one in Pennsylvania, produced results that are in some important respects consistent with our own. Wilms, Moore and Bolus (1987) studied a population of California proprietary and two-year college borrowers in selected fields of study and found that ethnicity, high school completion, annual income, and graduating with a degree or credential were significantly related to differences in default rates. Institution type contributed little to their model, once student characteristics were taken into account. Knapp and Seaks (1992) examined a population of borrowers at 26 Pennsylvania two-year and four-year campuses and also found that a group of institutional variables (including size, cost, highest degree, and institution type) had no impact on default rates compared to important borrower characteristics (such as race, parent income, and graduating with a degree). Our larger national database, containing borrowers from over a thousand institutions, and containing a greater array of organizational measures, strengthens their conclusions considerably.

We have **great difficulty explaining the consistent and powerful influence of race** in our own study, as well as in the others. In both our two models, being black or native American increases the probability of loan default by over 30 percentage points, controlling for all other variables. The influence of race on default does not fit conveniently within the conceptual models and theoretical frameworks we assembled for this study. We expected that parental income and education and high school graduation would displace the importance of race, but they do not. **We suspect that race, degree attainment, and marital status collectively may be obscuring the influence of other unmeassured variables** such as wealth, aspirations, motivation, and academic preparation.

There is some research evidence that supports this interpretation of our findings. For example, Blau and Graham (1990) found that young black families hold only about 18% of the wealth of young white families, even controlling for income and other demographic variables. Astin's 1983 study of disadvantaged minorities in higher education found that blacks were less academically prepared. Moreover, students from low income, minority families may feel that their academic abilities are more suited to the less rigorous academic levels of proprietary and 2-year schools offering lower degree attainment. They also may be more inclined to seek education for a first job and not recognize that the education gained in a four-year college may be more enduring in the labor market. Training for a specific vocational skill generally increases the risk of unemployment or underemployment, thus increasing the likelihood of default.

Finally, we believe that at least some of the influence of race in the model is a **statistical artifact** created by black and native American borrowers having both lower average parental income and smaller standard deviation in income compared to Asians and whites. This suppresses the mediating influence of parental income for these minorities.

None of the other studies included a measure of college academic performance. We use College GPA as a measure of student-institution fit, but it may also serve as a proxy for student ability and motivation. We also find that a college major in a "hard vs. soft" discipline lowers the default probability by two to three percent. By majoring in a scientific or engineering or agricultural field, students can lower the probability of default.

Our final Model in Table 11 provides evidence that at least some aspects of the current system are functioning as they were designed. Students from low income families are able to borrow, and if they earn good grades and stay in school to degree completion, the model suggests that they generate enough earnings to repay their loans.

The policy implications of our study seem rather clear. Most default behavior results from factors that are clearly beyond campus control, like race, broken marriages, dependent children, and future earnings. Educational institutions that serve high-risk black and native American student loan borrowers and offer them lower levels of training and degrees can expect to observe relatively high default rates.

The current national obsession with student loan default as an indicator of "accountability" seems completely paradoxical. The banking industry protects investors' money by using criteria that screen out risky borrowers. Our government offers taxpayers no such protection. It seems ridiculous that government policy, in the name of educational opportunity and access, encourages the granting of loans to risky borrowers (some of whom performed so poorly in the past that they did not graduate from high school), while at the same time, punishing the very institutions that serve these risky borrowers . If hospital trauma centers were penalized for having higher than average death rates, they would likely reduce or eliminate the admission of trauma patients (Knapp and Seaks, 1992). Similarly, the college admissions process could be used to screen out disadvantaged minorities who are at risk of defaulting on their loans, but the student loan program was created to increase access to higher education, not deny it. It seems counterproductive, even unfair, to blame institutions that serve risky borrowers for default behavior that may occur years after students have left the campus.

Our models suggest that campuses can best assist their student borrowers by creating a climate that promotes good academic performance, encourages study in both pure and applied scientific disciplines, and ensures student degree completion. Public concern and government policy should be directed at providing the resources needed to carry out this important responsibility.

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